

Reducing Stunting in the Western Highlands of Guatemala: Promoting the Consumption of Animal-Source Food to Optimize the Diets of Women and Young Children

Chronic malnutrition in children under 5 years of age is an urgent, widespread problem in the Western Highlands of Guatemala. In this region, more than 70% of children under 5 are stunted and nearly half (48%) are anemic (MSPAS 2010).

A Problem with Many Causes and Life-Long Consequences

Many factors contribute to chronic malnutrition in Guatemala, including suboptimal infant and young child feeding practices, low dietary diversity, food insecurity, lack of clean water and sanitation, poor hygiene, and poor access to health services (Chaparro 2012; De Pee and Bloem 2009). With regard to infant feeding, both the amount of food young children are fed and the variety of food they are given is inadequate to meet their nutritional needs.

Chronic malnutrition has far-reaching consequences, both for individual children and at a population level. Stunting (i.e., low height for age) is a result of poor growth in early childhood and is largely irreversible after 2 years of age. Chronically malnourished children are at high risk for infections, illness, and mortality. They also tend to suffer cognitive and developmental delays, which over the long term adversely affect school performance, attendance, and completion. In adulthood, they are likely to have reduced physical work capacity, which can limit their income and economic productivity (Black et al. 2013; Grantham-McGregor et al. 2007). Evidence also suggests that chronic malnutrition in childhood may increase the risk of cardiovascular disease and other chronic diseases in adulthood (DeBoer et al. 2012).



Photo Credit: Olga Santizo, courtesy of PhotoShare

Animal-Source Food as a Potential Solution

Increasing the consumption of animal-source food with optimal protein quality¹ promotes growth and prevents chronic malnutrition in children (Arimond and Ruel 2004; Darapheak et al. 2013; Krebs et al. 2011; Rah et al. 2010). Animal-source food (e.g., milk, meat, and eggs) is rich in essential micronutrients, containing more of vitamins A, D, and E, riboflavin (B2), calcium, iron, and zinc per 100 kcal than plant-based food. In addition, such nutrients are more bioavailable in animal-source food, which is also the sole source of vitamin B12 (Allen and Gillespie 2001). Unfortunately, women and children in developing countries rarely consume animal-source food due to poor access, high costs, and cultural barriers (Allen and Gillespie 2001). In the Western Highlands of Guatemala, it is difficult to find locally

¹Protein quality is determined by the level at which a protein contains “essential” amino acids that are required for maintenance and growth and cannot be synthesized in the body. During early childhood growth and pregnancy, protein quality is of greater importance due to high demand for certain “conditionally essential” amino acids, for which synthesis within the body is possible but not sufficient to meet the increased requirement. Protein contained in animal-source food is considered complete or high quality, as it provides sufficient amounts of essential and conditionally essential amino acids.

available, affordable, high-quality animal-source foods that can be promoted to families, caregivers, and mothers to increase children’s protein and micronutrient intake and improve nutrition outcomes.

To better understand and address this problem, in 2012 the Food and Nutrition Technical Assistance III Project (FANTA) and the Institute of Nutrition of Central America and Panama (INCAP) used the Optifood program to develop a set of food-based recommendations (FBRs) based on the local diet for children 6–23 months of age and pregnant and lactating women in Quiché and Huehuetenango. The Optifood program uses local dietary data to pinpoint nutrients that are inadequate in the local diet. It also identifies alternative local foods that can be promoted to close the nutrient gap and improve dietary adequacy (see text box).

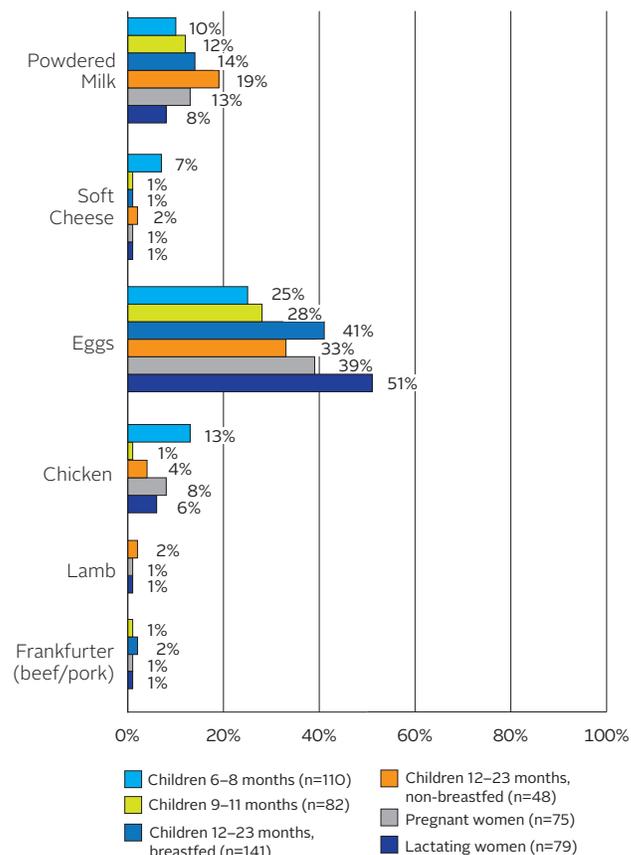
Analysis of Optifood Findings

A cross-sectional dietary survey was conducted among 381 caregivers of children 6–23 months of age and 154 pregnant and lactating women in Quiché and Huehuetenango to determine the adequacy of the local diet and develop the FBRs. Not surprisingly, the survey found that the respondents’ diets are largely plant-based, low in animal-source and fortified foods, and lacking in overall dietary diversity. It also revealed that 60% of the respondents’ dietary protein comes from maize.

Plant-based diets are problematic because nutrients are less bioavailable in plant-source food than in animal-source food. Plant-based diets also tend to have insufficient protein content and quality, since most plant proteins do not provide all the essential amino acids (De Pee and Bloem 2009). Heavy dietary reliance on a single plant-source food staple such as maize further exacerbates the problem.

Figure 1 shows the variety of animal-source foods consumed by each target group and indicates that meat consumption was low across all groups. For the most part, the only meats consumed by children were very small amounts of chicken and processed frankfurters, both of which are relatively low in zinc and iron as compared to red meat. Respondents rarely consumed liver and red meat, which are good sources of iron and B12. Although egg and dairy consumption was more common than meat in all target groups, it was still low.

Figure 1. Percentage Who Reported Consuming Animal-Source Food by Target Group (24-Hour Recall)



The Optifood Tool

The Optifood tool analyzes the quality and content of local diets and facilitates the development of evidence-based, population-specific recommendations for improving nutrient intake. Optifood uses a linear programming approach to simultaneously consider numerous parameters, including the dietary patterns and nutrient requirements of specific target groups as well as local food costs, nutrient content, and availability. Based on this analysis, Optifood can identify “problem nutrients” (nutrients that are difficult to acquire in sufficient quantity from the typical local diet) and the best local food sources of such nutrients. It can also analyze diet costs as well as compare and test various food-based recommendations (FBRs) and interventions. In addition, Optifood can be used to analyze the potential impact, in terms of nutrient provision, of adding new foods to the local diet, and test potential FBRs around these new foods to improve nutrient adequacy.

Analysis of the survey data in Optifood revealed that the most common problem nutrients were iron, zinc, and calcium. Animal source foods would help improve intake of these nutrients. Specifically, breastfed children 6–8 months of age were unlikely to obtain adequate iron, zinc, and calcium from local foods, zinc was unlikely to be provided in adequate amounts for breastfed children 9–11 months of age, and iron was unlikely to be provided in adequate amounts for breastfed children 12–23 months of age, while pregnant women were unlikely to obtain adequate amounts of iron, zinc, and folate. Inadequate intakes were likely even when fortified blended flour (such as Incaparina, Vitacereal, or fortified oats) was included in the diet, which suggests the need to include micronutrient supplements and more animal-source food in the diet.

Testing Yields Feasible Solutions

FANTA, INCAP, and the Nutri-Salud project tested the feasibility and acceptability of the FBRs developed from the Optifood analysis for children 6–23 months and pregnant and lactating women in Quiché and Huehuetenango, using the “trials of improved practices” qualitative methodology. During field interviews, study participants reported that regular meat consumption was not feasible for themselves or their children. Among the reasons noted were its high cost, lack of physical access to markets, lack of safe storage, and cultural norms around meal preparation (i.e., if meat is prepared, it should be shared among all family members, not given to only one person).

Because of these challenges, the recommendation to promote meat consumption was dropped. However, many study participants indicated that chicken liver consumption (once per week) is feasible for pregnant and lactating women because it is both accessible and affordable. Similarly, eggs were seen as a relatively affordable, acceptable, and accessible animal-source food for children.

Conclusion and Next Steps

Poor dietary diversity and diet quality continue to adversely affect the health of pregnant and lactating women and children 6–23 months of age in Guatemala’s Western Highland region. Further, affordability and accessibility of micronutrient-rich, animal-source foods present significant hurdles. Study

findings suggest the need to increase access to such food at local markets and create opportunities for local producers to sell eggs, liver, and other animal-source food at fair prices.

Key opportunities to provide support for improving access to animal-source food, potentially through the Ministry of Agriculture, USAID’S Western Highlands Integrated Program (WHIP), implementing partners, and the private sector, include:

- Encouraging livestock and agriculture extension agencies to support the local production of eggs, chicken liver, and other animal-source food, as well as fruits, vegetables, and other nutrient-dense food
- Increasing production of eggs and chicken liver to improve affordability and local availability, by both households and small rural community enterprises
- Supporting local markets to sell a variety of animal-source foods at affordable prices and promoting and expanding weekly mobile farmers markets to make animal-source food regularly available for sale to remote communities
- Reviewing strategies and approaches to promote increased household production of small livestock (particularly chickens and hens) to improve quality and diversity of diets, including revision and update of technical materials used by agricultural extensionists
- Developing appropriate storage options and technology for animal-source and other highly perishable food
- Creating opportunities for women to own and raise small livestock for sale and home consumption
- Expanding employment opportunities and improving wages to increase rural household incomes in the Western Highlands
- Providing nutrition education to improve diet quality and dietary diversity
- Implementing social and behavior change communication campaigns to promote the consumption of minimally processed, nutrient-dense, animal-source food

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Learn more about the Guatemala Optifood study at www.fantaproject.org/tools/optifood.



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